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ABSTRACT

This newsletter theme issue contains four articles which focus on the development of normal and handicapped infants in various settings. "The Baby's World," by Lois Barclay Murphy and Colleen T. Small, emphasizes experiences of sensation and discovery in the first three years of life, noting the role of caregivers and the cultural context. "The Developmentally Designed Group Care Setting: A Supportive Environment for Infants, Toddlers and Caregivers," by Louis Torelli, offers principles and illustrations of appropriate classroom physical environment arrangements. The third article, "Infant Stimulation: The Pros and Cons in Historical Perspective," by Anneliese F. Korner, discusses how early stimulation can broaden and enrich development and facilitate newly emerging developmental acquisitions. Finally, "The Development of Place Identity in the Child," by Harold M. Proshansky and Nina M. Gottlieb, examines the physical world socialization of the child as a sub-structure of his self-identity. (DB)

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[Infants and Toddlers]

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The Baby's World

by
Lois Barclay Murphy and Colleen T. Small

Since the work of Rene Spitz and John Bowlby on the profound importance of the baby's attachment to and interaction with the mother, research has continued to focus on and to contribute more and more insights into the many subtle aspects of this relationship.

By contrast, there has been less attention to the baby's spontaneous response to the larger world, with its many personal and impersonal aspects. The first months and years are a time of sensory delight, discovery and wonder. The exciting, inviting world of the infant and toddler is the subject of this essay.

While we will emphasize experiences of sensation and discovery that are common to many children in the first three years of life, we illustrate our points with observations of individual children we have known. It is important to remember that each baby responds to the world in his or her own way.

And while we focus on the child's spontaneous responses to the natural and man-made environment, we cannot neglect the role of the child's caregivers in helping the baby to find comfort in the world, in encouraging or impeding discovery, in giving meaning to experience through words and sensitively responding to the child's own way of experiencing each object or event.

Finally, we will examine the infant's sensory experience in the context of his culture.

The expanding universe

The arrival of a healthy baby in the strange new world outside of the cozy dark womb brings a series of tasks: to become at home in the world and to trust it, to get oriented to its many resources for gratification, for support of growth, and to its dangers, to select and to demand what will feed the baby's individual potentialities, autonomy and capacity to cope with stress.

LOIS BARCLAY MURPHY

Babies are born with a capacity for attention to, and soon, curiosity about the objects around them—stimuli some of which help to maintain the baby's equilibrium

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and some of which present challenges or distress. The baby's senses and motor system are ready to respond to the tastes, smells, sounds, sights, touch stimuli and motion experiences that come his way. These would be overwhelming if the baby were not protected by the fact that at first he or she can see only up to about eight inches from his face and and cannot move his body very far, so the quantity of stimulation is limited. His world expands gradually. The introduction to the new world is also helped by the fact that the baby has already heard sounds from inside the mother's body, such as her heartbeat, and from outside, such as music, and the baby has smelled and tasted the amniotic fluid around him. Sensory experience is not new.

The newborn baby who can watch a little dangling red ball cannot see a whole person. Specific experiences with mother, father or other caregiver gradually combine as he sees, hears, touches, smells, tastes different parts of each person. Similarly, the baby cannot see the whole room at first; out of doors only a small section of the world around him or her is within visual grasp. The world expands steadily with more and more experience and with maturation of the baby's vision.

With the ability to remember, the baby becomes familiar with more and more of the objects within view and in fact can get bored with the same old thing, restlessly reaching for (or "fussing") for something new and interesting. Reaching, touching, tasting, stretching to look up or around, listening; some babies' drive for stimulation seems insatiable.

Babies' interest and pleasure in new stimuli are not biologically extravagant—if there is a dearth of sensory nutrition, development is slowed or the baby may even give up and die. In a foundling hospital we visited in an undeveloped country there were no toys, no pictures on the wall, nothing for a crawling baby to explore, only one nurse for ten babies; every sort of stimulation was lacking. The mortality rate was 50%. In another foundling hospital, supposedly ideal, with one nurse for only four babies but a similar lack of visual stimuli, things to manipulate and discovery opportunities, the babies survived but with below average mental development. It is true that growth is pushed by genetic processes, but environmental nutrition is essential.

Put a three-month-old baby prone on the floor and she lifts her head to look around; hold a crying baby to your shoulder and he will stop crying, open his eyes and survey the new vista. Put a two-month-old baby in a crib with colored objects dangling from the sides and he will try to swipe at them. Or place him near a window with a sunbeam drifting in and he will watch his hand as the sunbeam shines on it.

The early years, then, are the child's years of exploring sensory and motor experiences in every area. Swooshing in mud puddles, making sand pies, drawing on the window pane with tooth paste or messing with mother's cold cream are expressions of the irresistible drive for tactile experiences. The baby and toddler stretches and turns, looks up and down, to one side and the other when something new catches his eye. He reaches up to catch a sunbeam and she stretches out her arms, the better to feel the delicious breeze. Only in unusual settings, such as Mammoth Cave, do we see adults using their bodies as flexibly as toddlers do to extend their vision. In the early years newness constantly confronts the child and his curiosity is the foundation of learning. The baby craves to see more and more.

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Cognitive maps

Each baby's world expands at a different rate, depending upon the range of the baby's interests and on the pattern of his or her sensory and motor development as well as the range of experiences. At one birthday party for a year-old baby, eight-month-old Peter scampered about the new house in curiosity, while 15-month-old Alec, who could not yet walk, sat in a corner intently exploring a large picture book, thumbing its pages like an adult, to my astonishment. Many factors are involved in these strikingly different responses to the environment. Peter's slender light build combined with excellent motor coordination, proprioceptive and enteroceptive integration with visual orientation, facilitated his activity. Alec's fine coordination of fingers integrated with his visual response made it possible for him to explore the picture book with sustained interest earlier than most little boys.

As children orient themselves to their surroundings they develop cognitive maps; they learn their way around the house as they crawl from room to room. Our Topeka two-year-olds knew their way around the block and were chased by four-year-olds who watched over them. Some Head Start three-year-olds even knew the way to a nearby grocery store where they bought a loaf of bread to take home.

The baby creates its cognitive map as do birds and squirrels. The crawling baby explores the kitchen cupboards along the floor; the toddler pulls a chair to a kitchen table and climbs up to poke into the higher cupboards. Mastering the path to interesting places develops a sense of competence and independence.

As we watch three-year-olds' constructions with miniature life toys we see how they absorb the structure of their home life—rigid in some instances, flexible and dynamic in others; in still others, chaotic. In Ahmedabad, India, some children arranged dolls in a circle, sitting on the floor as is the custom for a meal.

Sequences of daily life were played out by some New York children: the routine of getting up, washing, eating breakfast, going to work. A sequence over time was the theme of one little boy's play: at three, he arranged a house, then placed a horse on a boat to go off for a trip. (His mother was an architect who designed, built and furnished houses, then after each one took her little boy on a boat trip.) Even the conversation of parents may be assimilated and visualized by a child. During World War II, four-year-old Debbie set up household toys near herself, separated the house area from distant events and organized a battle scene in that far area.

In other words, the child's inner world is developed from early experiences—what he or she does, sees, and even hears.

Attachments to things

As part of developing feelings of being at home in the world babies and children feel strongly about their possessions—their cribs, their toys, their pets. In the Topeka study Molly was upset when she heard her parents talk about moving to another city, but she calmed down when her mother told her she could take her crib and the kitty.

The process of developing attachments to things, or canalization, extends to toys, foods, clothes, and even to the home setting. A three-month-old baby boy was restless when his parents brought him to visit us in the country. He relaxed visibly when he returned home. The attachment may even extend to familiar objects on the street. When little Al was taken to the country at the age of two, to get away from city heat, he looked around woefully, saying, "No cars, no taxis, no buses, no trucks, no wheels!"

Confinement and freedom

Babies differ in their feelings about confinement and freedom; most babies are comfortable in bassinets with soft coverings, but some active babies like Al kick off the covers as early as five or six weeks. Many babies crave contact too, and when they are moved from the cozy bassinet to a larger crib they are restless in the open space and even find it hard to go to sleep. One four-week-old baby in the Topeka study wiggled her way to a corner where she again had contact. When little Alec grew fussy in the crib to which he had been moved he quieted after we placed a large soft stuffed animal next to him as a companion.

Energetic toddlers even as young as one year old may resist confinement as Stewart did; he pulled out a spoke of his playpen and took it to his mother. In miniature life toy play at our nursery school many children broke the little wooden crib and others dramatized their resistance to confinement in their play with fences. At the same time, anxious children created protective areas for themselves with large blocks to wall them in.

Different children develop different patterns of trust and distrust in their world. Actually, it is sound for children to be able to discriminate—to trust those people and situations where they know they are safe, and to be cautious when they are doubtful. Excessive or persistent distrust inhibits the curiosity that motivates the child's exploration of the world and discovery of resources for coping with his needs.

The exciting world

It is in new encounters with different aspects of the world that the baby, especially from four or five months on, experiences surprise, delight, triumph in achievement and, as a toddler, wonder, along with puzzlement, and even anxiety. The foundation for a rich emotional life is laid early in the healthy baby. As successes in coping with challenges in the environment accumulate, the baby builds a foundation for optimism.

The borderline between satisfying stimulation and disintegrative overstimulation is often very thin. We see this when a father enjoys his baby's laughter as he is tossed in the air or tumbled in play, but is dismayed when that baby suddenly bursts into tears as his excitement becomes unmanageable, or the play goes on so long that the baby becomes exhausted. Babies differ in their capacity to take a large amount of stimulation.

They also differ in thresholds for pain and for milder degrees of discomfort. Sounds that one baby enjoys may be too loud for another, while vague or soft sounds are unpleasant for some babies.

Coping with stress and frustrations

Babies have individual ways of dealing with stress; one of the Topeka babies went to sleep when three observers of the research team converged at her crib to make simultaneous observations.

A toddler may cover his ears in protection from excessively loud sounds. Babies turn away from lights that are too bright and pull away from unwanted contact. If a parent or caregiver whom the child trusts is at hand, the child will stay close or cling or signal to be picked up when a threatening person comes near.

Use of environment for comfort

Inevitably babies experience disappointments and frustrations, and each baby develops his or her own consolation strategy to maintain an equilibrium. One day when I (LBM) was helping to care for babies in a foundling room of a children's hospital, I was impressed by the different comfort techniques of a group of three-month-old babies. After I had fed, changed and played with each infant, I had to turn to the next baby. After this separation one baby relaxed in its crib, sucking his thumb; another focused on looking at pictures on the wall; another rubbed his toes on a balloon hanging on the end of his crib. In contrast to these oral, visual, and tactile comfort techniques, a fourth baby became limp and unresponsive to any available stimulus. (I urged the social worker to find a good foster home placement for him as soon as possible since he was in urgent need of stimulation. This was done, and he responded well.)

The inviting world

As we watch babies, we see them "hooked on" elements of the environment that we take for granted. Consider stairs: we see toddlers fascinated by their invitation to climb and to discover different ways of getting down—sliding down on your tummy, or sitting down one step at a time, until you are ready to go down standing up—holding on to the banister and bringing both feet down on each step because you don't yet feel secure with one foot on a certain step and the other on the step below. It can take a year or more of experimenting with these methods before the three-year-old finally walks down stairs like an adult. Over these months, just sitting on a step to look at the world is satisfying.

A curb along the street invites hopping off and on again; a fence offers an exciting temptation to bang a stick along the spokes for the rhythmic sounds it makes. A railing can be leaned on or crept under. Adults do not see so many possibilities along the way, oriented as they are to the goal of the journey and their sense of propriety. While the adult sees trees as part of a landscape, a child enjoys trees one at a time, to hide behind or peek around, as a resource for fun or protection.

Wheels are important to adults for their use in conveying vehicles from place to place, but to children they are fascinating in themselves for their ability to go around and around as nothing else does. We have often seen little children playing with a bicycle or tricycle lying on the ground—pushing a wheel thoughtfully as if trying to understand how it does that.

Contributions from natural and manufactured objects

The extraordinary number of manufactured toys available for nursery schools and day care centers—puzzle boxes, building materials of many different kinds, playground equipment to stimulate varied motor experiences—provide a wide range of activities, including construction. However their sensory range is narrow—colors are chiefly primary red, blue, yellow and green, not the variety of tones to be seen in nature and in the home. Textures mostly limited to those of plastic and wood are also limited in comparison with textures in nature and home. And there is little stimulus for curiosity.

Occasionally we visited a day care center located near a vacant lot where wild flowers were blooming, but the children were not allowed to explore it. A teacher in another day care center took the children to the "wild place," helping them to pick the flowers and take them to the center; talking about the diffrences in colors, leaves, stems and how they grow from seeds the wind blows across the lot. Experiences in natural settings provide a variety of sensory and cognitive experiences, with oportunities for discoveries which lead to questions.

Perception and internalization

With all of the eager looking and reaching, what can we know about what is going on inside the baby's head? What does he absorb from the environment? What image of the world is he developing? Dr. David M. Levy reported that some babies under the age of six months cried at the sight of a doctor in a white coat, and even at the sight of a taxi like the one that took them to the doctor's office for their inoculation. Only at six months did a baby cry only at the sight of the inoculation needle.

This tells us that babies' early experience is global—the baby responds to the total experience and only gradually discriminates the specfic offending object. Global perception also is seen in babies' responses to satisfying people; one aspect of the stimulus person evokes the whole image, as when four-month-old Jennifer, hearing her father's footsteps after the front door opened, bounced up and down in her buggy as if he were already in sight. Differentiated feelings about objects can be seen in the last half of the first year, if not before, as when a Topeka mother said, "He loves his green frog." We cannot predict what toy or what color will be the favorite of a particular baby—or, for that matter, what foods or what music. Each one has his and her own tastes. The baby's inner world is built up of those favorite tastes and the rejected ones.

When we watch a child playing with blocks or miniature life toys we see the projection of integrated

LOIS BARCLAY MURPHY

patterns of the world as the child sees it. When we watched the crawling baby we could infer his cognitive map as he made a bee-line from the living room to the kitchen to find his mother. But at the age of three and four the child can create a model of home or, as we mentioned, play out a daily routine. He can also play out protests against restrictions as he breaks a toy crib or playpen. A child who felt insecure in a new situation barricaded himself within a protected area walled in by large blocks.

The baby's perception of his world in the early months may have major consequences for his later development. A deep, unassailable optimism and trust may have its roots in early global pleasure and comfort. We saw the opposite in the Children's Division of the Menninger Clinic: when I reviewed 200 cases of disturbed children, the most severely disturbed and difficult to treat had a "bad start"; their mothers said, "I wasn't able to comfort him; he cried and cried." Such global misery persisted in the form of anger and despair; there was no foundation of good feeling to which a therapist could reach.

The caregiver

Fascinating as the environment may be to the infant, he cannot survive in it without a caregiver. Parents and other caregivers protect the baby. They also help the infant learn to soothe himself; allow the baby to influence his world; and offer the child priceless opportunities to share observations through language.

The parent's or other caregiver's role is to respect the baby's way of restoring its equilibrium, to see that he has access to whatever in the environment he finds soothing. That is, he may need to be placed where he can see pictures on the wall or trees out of the window if visual stimuli are calming; or he may want a soft animal toy for tactile comfort; or quiet rhythmic music to listen to; in the early weeks, help in getting his hand to his mouth so he can suck on fist, fingers or thumb may be the chief resource. Adults can help, as when a father picks up a baby and holds it up to his shoulder so that the baby can look at a new vista, but it is the baby who quiets himself, recovers his equilibrium and lays a foundation for maintaining integration as he goes. This involves selectivity, both retreating from, and reaching out to, the world around him.

Influence on the world

As we watch healthy babies in their own settings, their influence on their caregivers and thus their world is impressive. Just now the postman brought me (LBM) a letter from a young mother who tells me that five-month-old Alex "has become more demanding now—if he doesn't like something, he sticks his arms and legs straight out and grunts loudly. He's very definite when he wants or doesn't want to eat. I'm having to adjust."

This is only a hint of the way in which a baby can change or influence his world. One of our Topeka babies at six months would bounce on his mother's lap to stimulate her to bounce him; our baby would blow repeatedly while looking toward the record player to tell us that he wanted us to play a record (we had a habit of blowing on the record to remove any specks of dust). An action associated with a pleasurable event could make it happen, the baby assumed, although he had no words to commmunicate this. In such ways some babies can select from the world and demand from it the experiences or objects they find pleasurable. Perceptive parents pay attention to initiatives of the baby and encourage them, realizing that these are the beginnings of healthy coping.

Freedom to discover

We see great differences between parents and caregivers who encourage and share the toddler's curiosity about the environment and those who are indifferent or who stifle the chid's impulse to peek, peer, or poke into interesting openings. We see parents in the post office who tolerantly keep an eye on a wandering toddler and others who grab the child, insisting "Stay here!" One mother smiles in amusement when her child uses a banana for a telephone; another protests, "Bananas are not to play with!" The mother or caregiver who observes the child with interest in the child's-eye view of the world finds delight in his or her unexpected and original ideas.

Connecting objects and language

From the first teddy bear that is given to the baby (or stuffed kitty or rabbit) the baby should hear the word that names the object: "Here is your bear!" The word makes a connection between the real thing and the idea of it. Babies need to have these bridges made clearly and consistently. "Here is your spoon" or ball, or bottle and so on. When objects are given to the baby without naming them, images form in the baby's mind, to be sure, but vocabulary lags. Words are a crucial part of our mental furniture.

We see some parents and caregivers taking children to the zoo with never a word being said, while others talk with their children about the animals. When the child stops, fascinated by the zebra, it is important to say, "Yes, that's a *zebra*—he always has those stripes. Horses don't have stripes like that, do they?" The parent can help the child verbalize what the animal is doing or trying to do. This is part of sharing the experience with the child.

As the toddler gets interested in language, names of things stamp in their differentiated character, although some children connect analogies with objects or parts of objects, as when little Midge referred to the bottom of a table leg as its "hoof." In these days of busy working parents and group day care, a conversation between one child and one adult is rare. But if the child has little or no opportunity to share his observations in words, language development lags.

The cultural context

In different parts of the world babies look out from different angles: in Indian villages, for instance, a baby is carried on the mother's hips under her sari; in Nigeria the baby is tucked into a broad sash on the mother's back, covered up to its neck. These babies go wherever their mothers go; they look out at a wider world than that seen by most American babies who spend much of their time in a crib, playpen or stroller, sitting in a high chair or a baby-swing, waiting for the day when they can walk upright like adults.

In their various types of "furniture," American babies have less skin and eye contact with caregivers than do babies in cultures where they are carried by members of the family. A mother or caregiver pushing a stroller does not see the baby who may be slumped uncomfortably down in the seat. By contrast, the Indian mother is immediately aware of discomfort in the baby she carries on her hip. Like other travellers to India, we noticed that babies do not cry as much there as they do in America; they do not need to, when mothers respond quickly to restlessness. In Nigeria when a mother senses movement in the baby on her back, she reaches for him, holds him out in front of her, makes sssing sounds to stimulate the baby to urinate, cuddles him and replaces him on her back. In both instances there is sustained contact and communication between mother and baby.

In our present-day mobile world, even babies and toddlers travel with parents in cars, on buses, subways, trains and planes. We see babies crying from fatigue or tedium; or cuddled and sleeping; toddlers looking at picture books or trying to get out of the seat to explore the aisle; mothers patient or impatient, resourceful or exhausted with the effort to keep the child quiet. We see tired mothers slap restless children: "Sit *down*!" Even if parents attempt to explain the trip to the child, it is hard for a child under three to understand why it takes so long. It is hard to sit still and be quiet, and for an active child unbearable. With the exception of safety seats for children riding in automobiles, our culture makes no provision for children's needs in vehicles used for travel. The result too often is tension and stress for both child and parents.

The fact that American children do not do so well in science suggests that we need to look at basic processes involved in scientific thinking and interests: observation, discovery, comparison of objects, scrutiny of parts, watching effects of combining two or more materials, and changes with heat and cold. Even two-year-olds and three-year-olds can see the difference between a butterfly and a hummingbird, or a spider and a large ant, a chipmunk and a mouse.

Where winter brings freezing weather, children can learn about the different forms water can take, from clouds to rain, or hail, and snow and icicles. In warmer climates they can still learn about the making of ice cubes; and anywhere the making of steam is easy. Scores of interesting facts of nature including processes of change can be introduced to young children. Encouraging spontaneous curiosity gives a foundation for continued learning.

Conclusion

In order to guarantee the optimal development of our babies and young children we need to look at the total environment in which they are spending their days. How much does it provide for all sensory, cognitive, motor, emotional needs of the children? How much does it offer in the way of responsive caregiving that values spontaneity and originality? Can we make the effort to share the child's own way of experiencing the world and, in the process, offer support for all the child's potentialities?

As Walt Whitman wrote:
There was a child went forth every day
And the first object he looked upon, that object he became
And that object became part of him for the day or a certain part of the day
Or for many years or stretching cycles of years.

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by **LOUIS TORELLI, M.S.**

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The Developmentally Designed Group Care Setting: A Supportive Environment for Infants, Toddlers and Caregivers

The physical environment in a group care setting affects children, caregivers, and their interaction. A well-designed environment is, of course, safe for infants and toddlers, but it also supports their emotional well-being, stimulates their senses and challenges their motor skills. A well-designed group care environment promotes children's individual and social development. It is comfortable and aesthetically attractive to both children and their caregivers.

A developmental environment is designed specifically to promote learning that is both age-appropriate and child-directed. The setting, layout and equipment all give infants many opportunities to challenge themselves through seeing, touching, feeling and moving. In surroundings that are safe to explore freely, infants learn to map their environment cognitively, to manipulate it, and to master it.

In group care classrooms without a developmental design, one generally observes young children spending a significant amount of time in either aimless wandering or teacher-directed activities. Because making friends is a social skill that depends on experience as well as age, a group care environment that is teacher-directed can deprive infants and toddlers of opportunities to enjoy positive interaction with their peers. Consider a toddler classroom where the teacher takes out baskets of *Duplos*, brings them to the middle of the room, and sits on the floor surrounded by ten toddlers—all shoulder to shoulder. After only a minute or so, one child grabs another's *Duplos*. While the teacher encourages this pair to "be gentle," the same battle is beginning between two other children. Then a toddler who has been racing around the classroom suddenly runs to the middle of the room and kicks the tower of another child who has been deeply involved in play.

In contrast, a developmentally designed environment offers infants and toddlers choices of activities and opportunities to break away from the larger group. A multi-level design, for example, varies the floor height with appropriately scaled platforms, lofts, "nests" and canopies. These mini learning environments set up a landscape for safe exploration in which infants can handle a toy, look at a book, stack blocks, crawl up steps, or simply watch the adults and other children from a cozy, semi-enclosed "private space."

For toddlers, a developmental design would also include an area for manipulative play with *Duplos*, shape sorters, pop beads, and the like. Such an area would be enclosed by shelves, low

walls, or carpeted platforms. Because this would be one of several activity areas available, toddlers could choose themselves when they wanted to engage in this kind of experience and for how long.

Mini learning areas encourage privacy and small-group interaction rather than wandering and herding. In smaller groups, young children can be intensely involved with each other. In an environment that encourages focused play in small groups, relationships among children are less aggressive and more supportive.

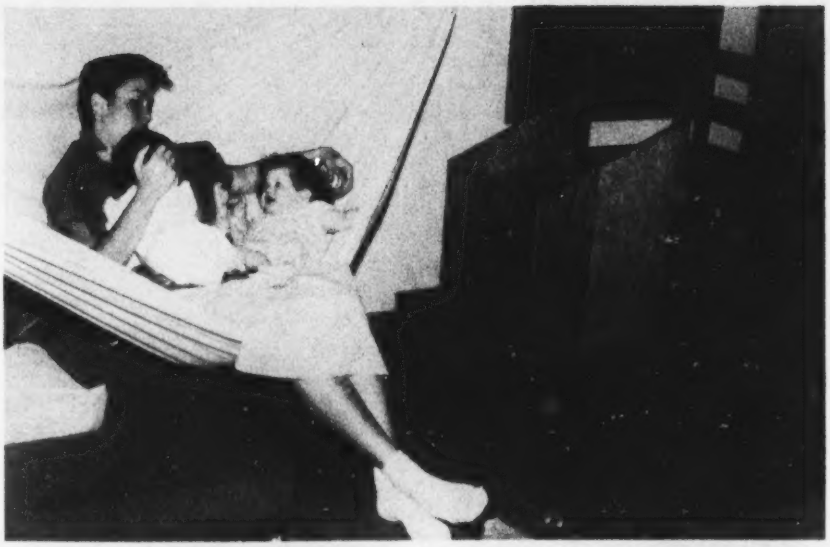
After her classroom was redesigned according to developmental concepts, a toddler teacher summarized the differences for children and for herself:

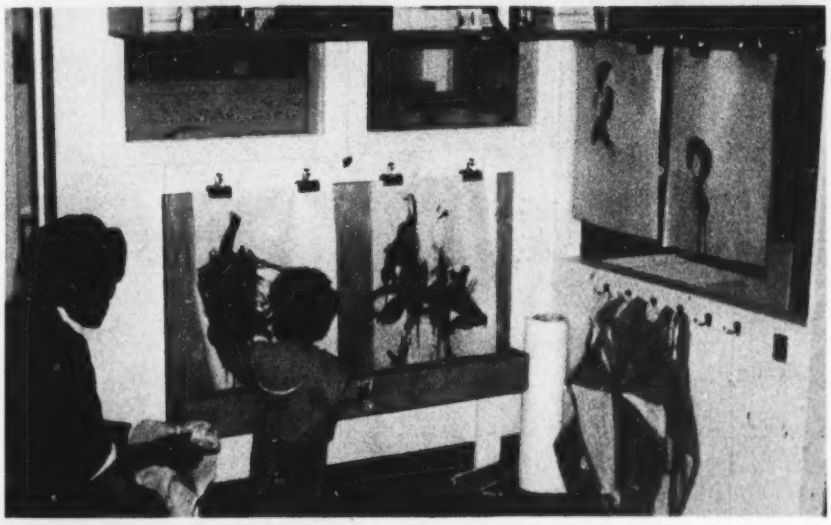
"You can feel the difference when you walk in the room. It's so much more comfortable! Instead of moving around aimlessly, the kids are much more focused on activities. Now they can be active in the classroom without getting into each other's space. Instead of climbing on furniture, they have a place to climb.

Having all this storage makes me a much more organized teacher. In a way I really feel spoiled. But then I think, the kids deserve this, and I deserve this.

It makes me feel so happy."

Let us consider some specific elements of a well-designed group care environment for infants and toddlers.





Layout

Create mini learning environments by placing multi-level activity areas around the periphery of the classroom. This leaves the middle of the room open for traffic lanes and "stage set" activities such as music and movement experiences. The open central section itself can be varied by using portable equipment such as carpeted risers and bolsters.

Motor challenge

Because motor activity is critical to the overall development of infants and toddlers, the physical environment must provide safe and appropriate motor challenges. A developmentally designed environment supports ease of movement, which then encourages active exploration.

Contrast an environment that encourages climbing, crawling, running and jumping with one that does not. The need to move still exists, but the environment does not support this

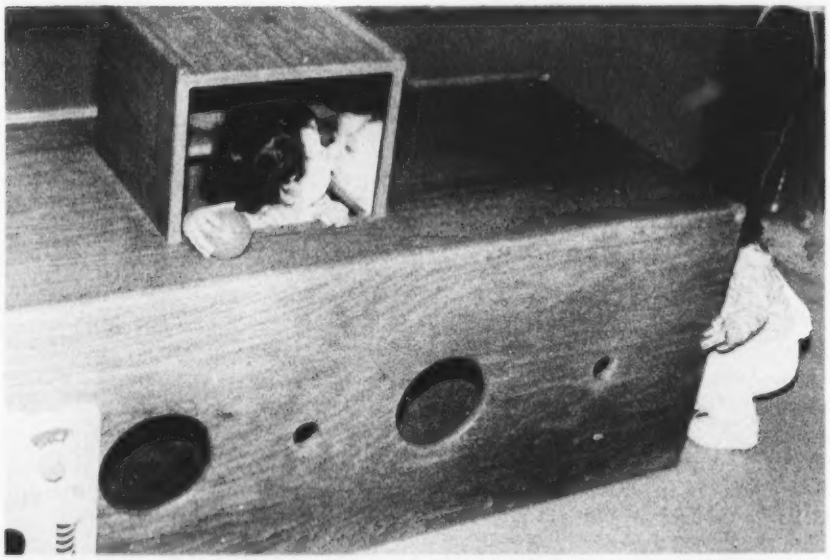
need. When the setting lacks appropriate equipment, the ten-month-old still moves, but she uses the high chair to pull up to standing and then is redirected because this is not safe. The eighteen-month-old attempts to use the toy and book shelf as a climbing apparatus, but he too is redirected. The two-year-old who continually gets up on the table to jump off is redirected as well. The message to these children is: "Self-initiated exploration is not acceptable."

But an environment designed to meet infant and toddler needs supports and encourages active exploration. The children get the message that it is fine to explore and take risks here. Their motor exploration leads to motor competence, which then contributes to emotional well-being.

The role of equipment

Appropriate equipment is essential to meet the motor needs of infants and toddlers in group care. Equipment also affects peer relationships significantly. For example, equipment that may be ideal for individual development may be a burden in a group care environment. And since the field of group infant care is in its own infancy, choices of commercially available equipment are still limited.

If the equipment were designed to allow more than one child to use it simultaneously, the situation would no longer be stressful for either children or caregiver. Toddlers could be more actively involved in motor exploration, and they would also have an opportunity for positive peer interaction. Instead of controlling and redirecting, the caregiver could be observing, learning more about the infants in her care.



Consider the infant ladder-slide found in many child care centers. Older infants and toddlers love to use it, but only one child at a time can play on it. In order for children to use this slide safely, the caregiver must police it, having children wait their turns and redirecting those who have difficulty doing so.

Flexibility for mixed age groups

Mixed age groups present a particular challenge. The environment must support the motor interests of older infants and toddlers while providing safe, relaxed care for young infants.

Shelving, low walls, large pillows, mats, platforms and portable risers can all be used to separate different activities and thus respond flexibly to the diverse needs and interests of a mixed age group. When the whole group is in the room, the caregiver can enclose a corner with a few portable risers. Younger infants will be safe in this protected space with a caregiver, while the older infants and toddlers move freely around the classroom. When half the group is outdoors or several infants are napping, the caregiver can redesign the space to allow for more open play and movement.

Using storage for flexibility

Every activity area in the classroom—for eating, manipulatives, art, books, blocks, etc.—should have its own storage space. To reserve as much space as possible for children's use, locate storage space on the walls, at a height of 48 inches or more.

Infant/toddler caregivers inevitably spend much of their time changing diapers. Well-designed storage in diaper changing areas can leave the caregiver available to engage in responsive interaction with the child during diaper changing.

Mental health

A developmentally appropriate space is designed to be emotionally supportive for both children and adults. The setting encourages relaxation. It invites one to spend time.

Track lighting, carpeting, pillows, textured wall hangings, plants and animals can all contribute to a

comfortable environment. Photographs of children and family members; wide, full-length plexiglass mirrors; and hammocks for rocking infants all offer emotional support. (Hammocks work better than rocking chairs because they allow the caregiver to rock more than one infant at a time if necessary. Rocking chairs can seriously hurt an infant who crawls behind one in motion; they also take up floor space, while hammocks can be taken off their hooks and stored when not in use.)

Windows—especially those that open and look out to trees, grass, and passersby—contribute to a relaxed setting. Because older infants and toddlers love to watch others, child-level windows that look into another classroom can function as an additional learning center.

Privacy

Being alone provides time essential for reflection and growth. Although most adults recognize the need for privacy, we often expect infants and toddlers to function well in group care situations for upwards of ten hours a day, five days a week. Private spaces in the group care environment support the development of the young child's self-concept and personal identity. They assist all ages in understanding the "I" in relation to the "thou."

A private space could be a tunnel, a carpeted built-in cabinet with the doors removed, a cozy loft space, or a few risers enclosing a small corner of the room. Instead of experiencing the stress of being in a large group all day, the infant can withdraw to a private space to rest, observe, and recharge emotionally. With access to a private space, two toddlers who are just beginning to develop a relationship can go off together. Opportunities for privacy not only support the infants' developing sense of self; they also reduce aggression among children.

The people in the environment

While a developmentally designed environment adds significantly to the quality of group care for infants and toddlers, other components of care are equally critical. While considerable attention has been paid to adult/child ratios, caregiver training and parent involvement, group size has still not been recognized uniformly as a key variable in quality care. A decade ago the National Day Care Study (Ruopp, 1979) found that too many children and adults grouped in one space affected relationships adversely. When more than seven infants or eleven two-year-olds were cared for in a group—even with one adult for three infants and one adult for four two-year-olds—observers saw more crying, hostility, and apathy and less cooperation, reflection and elaborate play than in smaller groups. In large groups, the infant experiences sensory overload and has a harder time forming a close relationship with a specific caregiver; forming a group identity is difficult.

Conclusion

A developmentally designed environment offers infants and toddlers opportunities to explore, make choices, and master their world. It offers caregivers a chance to be observers, facilitators and supporters of all aspects of development in the early years. A well designed child care environment not only reassures families but invites them. When an environment is designed to be functional, attractive and developmentally supportive, everyone feels well cared for.

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Infant Stimulation: The Pros and Cons in Historical Perspective

by

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The topic of infant stimulation is an issue that has certainly received a lot of attention in recent years. We have heard a great deal about the importance of infant stimulation for the development of babies and we also have been made keenly aware of the developmental damage caused when infants are deprived of stimulation. As we all know, there has been much talk in the media about how to create super-babies through early stimulation. Mothers go to the Prenatal University to learn to talk to their fetuses in an attempt to make them smarter. Infants are exposed to flash cards to teach them special skills and to accelerate their ability to read.

The change in views regarding infant stimulation is typical of what so frequently happens in this country: we zealously adhere to conditions prevailing at the time, and when the pendulum swings, we think that we have made a new discovery.

There are two fallacious assumptions driving these types of practices: One is the common belief that if stimulation is beneficial, then lots of stimulations must be even better. More is not necessarily better. The other erroneous assumption is that if one succeeds in *accelerating* development, one will succeed in forever creating a more intelligent child. There is something very wrong in this assumption. In fact, there is a real flaw in thinking that this might be so. A *faster rate* of developing does not guarantee a *higher level* of functioning in the long run. The assumption that faster development will lead to higher intelligence seems to stem from the fact that inherently intelligent children usually are precocious. This fact is then turned around to mean that if only one were to succeed in speeding up development, one would create inherently more intelligent children. There is no evidence whatsoever that this is the case.

In this paper, I will not be concerned about how one might *accelerate* development through early stimulation. Instead, I will describe how early stimulation can *broaden* and *enrich* development, in what way stimulation is essential to *maintain* development and how it can *facilitate* newly emerging developmental acquisitions. I will illustrate these points with examples from the literature on newborn and particularly preterm infant development. I will stress developmental theory that should guide infant stimulation, and will focus on the historical swings we have undergone in our views on this subject. And I will also describe the developmental relevance of stimulation for infants in general and for individual types of infants in particular.

FLORENCE SHARP

The developmental relevance of stimulation for infants in general

There currently is a lively controversy regarding the benefits and potential hazards of providing stimulation to preterm infants. Seen from an historical perspective, this controversy is not surprising. It combines vestiges of successive historical swings in the prevailing view as to what preterm infants need to survive and to develop. The change in views regarding infant stimulation is a typical example of what so frequently happens in this county: we zealously adhere to convictions prevailing at the time, and when the pendulum swings, we tend to think that we have made a new discovery. The French have a saying for this which is "the more things change, the more they stay the same" or, I would add, at least more or less the same.

With respect to preterm infants, it was only with the advent of the incubator in the early part of this century that it became possible to save these infants who would otherwise have died of hypothermia. Until the early 1960's, it was the prevailing view that preterm infants were too fragile to tolerate any stimulation. Minimal handling was therefore the prescribed regimen for care of these infants. As time went on and under the influence of a growing literature of the deleterious effects of maternal and/or sensory deprivation,

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behavioral scientists became very much concerned that preterm infants raised in what appropriately were called "isolettes" may be sensorially deprived. To offset the presumed sensory isolation of preterm infants, intervention studies involving sensory stimulations were instituted, beginning with a study by Hasselmeyer (1964), a research nurse. A great variety of intervention studies followed which used tactile, vestibularproprioceptive, auditory, visual, or social stimulation, singly or in combination. However, in the late 1970's, we began to learn that instead of being sensorially deprived, preterm infants were bombarded by sensory stimuli emanating both from the technological environment in which they were raised and from the intensive medical care they were receiving to keep them alive. From studies of the physical environment, we learned that preterm infants are exposed to very high levels of monotonous noise and illumination (e.g., Lawson, Daum, & Terkowitz, 1977; Gottfried & Gaiter, 1985). We also learned that the infants' intensive medical care disrupts their sleep (e.g., Korones, 1976; Lucey, 1977) and at times causes oxygen desaturation (e.g., Speidel, 1978; Long, Philip & Lucey, 1980; Gorski, 1983). As a result of these new findings minimal handling protocols have again become prevalent. We may well wonder, have we come full circle? Perhaps we have, but not quite.

We have learned that not all preterm infants are too fragile to tolerate any stimulation. We have also learned that preterm infants derive a great variety of benefits from different types of stimulation. The questions have become: stimulation for whom, what kind, how much, at what intervals, at what post-conceptional age, and for what purposes?

We *have* learned that not *all* preterm infants are too fragile to tolerate any stimulation, and that responses reflecting physiological or behavioral disorganizations result mostly from the aversive, stressful or noxious stimulation which frequently attends intensive care. And we have also learned from the many recent intervention studies that preterm infants derive a great variety of benefits from different types of stimulation. The question now is *whether* stimulation for preterm infants is indicated. *The issue has become: stimulation for whom, what kind, how much, at what intervals, at what post-conceptional age, and for what purposes?*

Unfortunately, many intervention studies with preterm infants in the past have been based on only the vaguest theoretical considerations. Nevertheless, one theoretical controversy stands out very clearly, originating from differences in the perception about what preterm infants need. On the one hand, preterm infants frequently have been viewed as being deprived of the many forms of stimulation that are prevalent in the natural home environment; on the other hand, preterm infants have been viewed as deprived of the many different forms of stimulation which are prevalent *in utero*. Depending on the post-conceptional age of the infant, a good argument could be made both for and against each of these views. One could argue that both young and older preterm infants need intervention that compensates for an experiential deficit, but that this deficit will differ in kind depending on the post-conceptional age of the infant. For example, the very young preterm infant, while functioning quite differently from a fetus, may nevertheless be deprived of the containment and the vestibular-proprioceptive or movement stimulation so prevalent *in utero*. This does not mean that in providing compensatory stimulation in these modalities that one should attempt to *simulate* the intrauterine enrivonment, even if this were possible. There is a vast qualitative difference between providing stimulation in a *sensory modality* prevalent *in utero* and trying to *imitate* what is going on *in utero*. In the case of older infants, one could argue that they are of an age when they are deprived of the auditory, visual and social stimulation so prevalent in the home environment. However, here too, we must remember that infants born prematurely function differently from fullterm infants even when they are of the same post-conceptional age. For example, we know from studies by Field (1979), Brown and Bakeman (1979) and others that in interactions with their caregivers, infants born prematurely easily become disorganized unless they are handled differently from fullterms.

Stimulation and preterm infants

If one can agree that not all preterm infants are too fragile to tolerate stimulation, two very important questions need to be addressed. The first one is, what purposes might stimulation serve in the development of preterm infants? The second one is, should the choice of the form of stimulation be influenced and guided by the infant's post-conceptional age? I will attempt to address the second question first. Judging from the literature of both animal and human prenatal development, it seems indeed important to consider the infant's post-conceptional age in the choice of the modality of stimulation to be given. In the many species studied, it appears that sensory systems mature in an orderly progression. Gottlieb (1971), in reviewing the ontogeny of sensory function of birds and mammals including man, clearly demonstrated an invariant sequence of development in which sensory systems become functional, beginning with cutaneous responsivity in the oral or snout region, and then progressing to vestibular, auditory and visual responsivity. The onset of olfaction and gustatory function occurs between the development of vestibular and auditory functions (Gottlieb, 1986).

There are a great number of studies reviewed by Gottlieb (1976), including those by McGraw (1946), which show that sensory systems begin to function before their structures have completely matured, and that, in ontogency, there is a bi-directional influence between structure and function. This view does not contradict the powerful genetic contribution to neural maturation. It simply suggests that, in Gottlieb's words (1976),—"genes give rise to structural maturation processes that are susceptible to (and in some cases, possibly depend upon) the influence of function before complete maturity is attained" (page 218). In the same paper, Gottlieb (1976) presents evidence from a number of studies which suggests that function or experience,

whether spontaneous or evoked, not only has a maintenance role but may, in addition, exert a facilitative and inductive influence on early neural maturation and behavioral development.

If this is so, one would think that evolution has seen to it that conditions *in utero* would provide the stimulation necessary for optimizing the outcome of pregnancy. Premature birth must of necessity represent a major and abrupt disruption of this process. It therefore seems to make sense that, in designing intervention studies with preterm infants, one consider which sensory functions were likely disrupted in their development by the premature birth. This will, of course, vary depending on the post-conceptional age of the infant. Therefore, to be most effective, infant stimulation should be, if at all possible, maturationally relevant.

What sensory functions were likely disrupted in their development by the premature birth of an infant? This will vary according to post-conceptional age. To be most effective, infant stimulation should be, if at all possible, maturationally relevant.

From this perspective, one can infer the answer to my first question, which asked what purposes might stimulation serve in the development of preterm infants. By providing stimulation which is designed to compensate for an experiential deficit by activating maturationally relevant sensory systems, one might assist to some extent in the resumption of a process which may have been abruptly interrupted by the infant's premature birth. In the context of this theoretical framework, the goal of sensory stimulation for preterm infants would be to put the infant's development back on track. Because I hold this view, the aim of my own intervention studies has been not to *accelerate* development but, if possible, to maintain and facilitate it. Thus, in setting up intervention studies, it makes sense, to me at least, that one use forms of stimulation which activate sensory systems which have or are about to mature; and that in choosing outcome measures, one look for gains in the functioning of these sensory systems, as well as for the onset of functioning of the sensory systems next in line to mature. With respect to the latter, it is of interest that stimulation of one sensory system can induce the functioning of sensory systems which are about to develop. This is illustrated by studies by Neal (1967), Barnard and Bee (1983) and by one of our own studies (Korner et al., 1983), which have shown that preterm infants provided with movement stimulation began to function better in the auditory and visual spheres than did controls.

The next question is, of course, how does one best implement maturationally relevant sensory stimulation to preterm infants? Such implementation not only requires familiarity with developmental theory regarding prenatal development, but it also involves a trial and error approach, a little bit of luck and a great deal of intuitive thinking.

Even when one chooses to provide what appears to be maturationally relevant sensory stimulation, much depends on precisely how such stimulation is imparted. There is an infinite number of choices one can make. Let us take the example of providing vestibular-proprioceptive stimulation, which is a form of stimulation that is ontogenetically highly relevant for very young preterm infants. Certainly not all movement stimulation should be expected to produce the same effects. Yet, judging from firsthand experience without intervention studies, in which we used waterbeds to provide movement stimulation to preterm infants, this is frequently assumed. To illustrate, waterbeds can be soft or hard, insulated or not, provide containment or not, oscillate regularly, irregularly or intermittently, gently or vigorously at high or at low frequencies or not at all; and yet it has been widely assumed that all types of waterbeds, merely by virtue of *being* waterbeds, will have the same effects. In fact, so-called "bump beds" which do not use waterbeds at all have been used on the assumption that intermittent, rather vigorous jerks would have equivalent effects in reducing apnea as had very gently oscillating waterbeds. Probably the crassest example of sloppy, analogous reasoning was perpetrated by a company that prepared a brochure on apnea therapy which summarized all of our research with waterbeds, from which they concluded that their device, producing undulating displacement of air, would be much more convenient to use for the same purposes.

It is clear from many other examples that effects usually do not generalize. Much depends on precisely how stimulation , even in the same sensory modality, is delivered.

Let us take the example of intervention studies providing tactile stimulation to preterm infants. Tactile stimulation is, of course, multimodal and is almost universally associated with, and inseparable from different types and amounts of other forms of stimulation, such as vestibular-proprioceptive, visual and auditory stimulation, as well as containment and textural sensory experience. Small wonder that with these admixtures of different forms of stimulation, studies involving touch, extra handling, or other forms of tactile stimulation produce vastly different results. This problem can be studied with much greater precision in research using animal models than would ever be possible in studies with humans. Very minor changes in kind, quality, quantity, or interval of stimulation can lead to major differences in outcome (e.g., Brown and Martin, 1974; Schanberg, Evoniuk and Kuhn, 1984). In the case of tactile stimulation, Schanberg et al. (1984) demonstrated, for example, that vigorous tactile stimulation of rat pups using a moistened brush, completely prevented the effects of maternal deprivation, while other forms of tactile stimulation, such as light stroking with a brush or tail pinching, were totally ineffective. One may infer from this and other kinds of evidence in the literature, that the specific stimulus characteristics of the stimulation given and the specific research protocols used will differentially affect outcomes and the chances of replication of previous findings.

Outcomes are not only influenced by the kinds of stimulation given and the sensory modalities used. Much also depends on what is to be achieved through

stimulation. Judging from the literature, to soothe infants, one would provide slow, gentle, continuous if not redundant stimulation, no matter what the modality used. To rouse infants, one would provide more vigorous, faster and/or intermittent stimulation. If one's primary aim is to facilitate weight gain in preterm infants, one might do well to heed the results reported in the early experience literature based on work with young animals. Consistently, extra handling of young rodents increased weight gain in handled rats as compared with untreated controls, an effect mediated by neuroendocrine responses which Denenberg (1975) attributed to mild stress. It is of interest that, with a few notable exceptions, most of the intervention studies with preterm infants that use extra handling, report higher weight gains in the experimental groups. It may not even be the extra handling that was responsible for the increased weight gain; any moderately vigorous, periodic stimulation might bring about the same effects. For example, Freedman et al. (1966), Neal (1967), and Kramer and Pierpoint (1976), reported significant weight gains in the experimental groups as a result of moderately vigorous and periodic mechanical rocking.

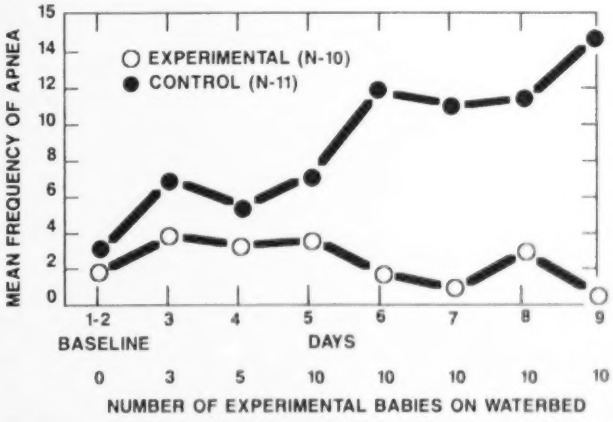

Figure 1. Comparison Between Experimental and Control Groups in the Mean Daily Apnea Incidence. This figure was first published in *Pediatrics*, 56, 3, September 1975, pp. 361-367. Reprinted by permission.

Earlier in this paper, I mentioned that with the many benefits preterm infants have shown to derive from intervention, the question no longer is *whether* stimulation for these infants is indicated. The issue has become stimulation of what kind, how much, at what post-conceptional age, at what intervals, for what purposes and for whom. I have touched on all of these issues except the all important last one. It is probably fair to say that extra stimulation may not be indicated for many infants who are in the process of struggling to achieve some sort of homeostatic equilibrium, or who are so weakened by recent severe illness that they cannot deal with even the most minor challenges. We had an instructive firsthand experience in one of our studies (Korner, Guilleminault, Van den Hoed & Baldwin, 1978) which pointed to this most important problem. In a prior study (Korner, Kraemer, Haffner, & Cosper, 1975), we found that low-risk preterm infants randomly assigned to waterbeds which gently oscillated in the rhythm of maternal resting respirations had significantly fewer apneas than did controls.

In a replication study (Korner et al., 1978), in which we used each baby as its own control in a counter-balanced crossover design, we found confirmation of our previous finding that while the infants were on the oscillating waterbeds, they had significantly less apnea.

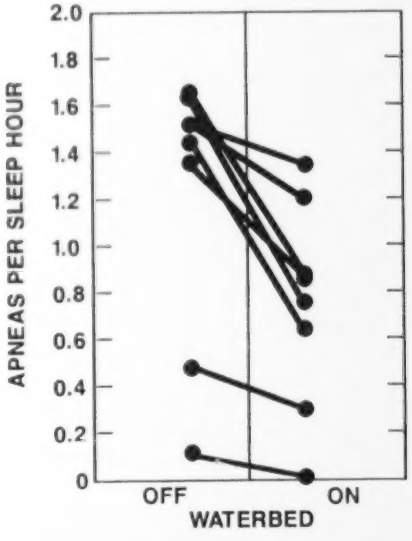

Figure 2. Apnea Monitor Alarms per Sleep Hour, Off and On the Oscillating Waterbed. Matched-pairs *t*-test, Two-tailed, p. ◁ .005. This figure was first published in *Pediatrics*, 61, 1978, pp. 528-533. Reprinted by permission.

However, when we looked at the most severe types of apnea as defined by their association with slowing of the heart rate to below 80 beats per minute, we found that one infant's response ran completely counter to that of the group that showed very marked reductions of these types of apnea.

This infant's history of apnea prior to our polygraphic recording and his medical course after discharge from the hospital revealed that this infant's diagnosis probably was not one of typical and uncomplicated apnea of prematurity. Many days prior to our study, this infant had severe bradycardia in the absence of apnea. He was asphyxiated at birth and had necrotizing enterocolitis that was diagnosed when he was four days old. After he was weaned from the respirator, he immediately had severe attacks of bradycardia which only later became associated with apnea. When we recorded this infant polygraphically, he had a much larger proportion of osbtructive apnea than any of the other infants in the group. He continued to have many medical problems after discharge, including surgery for pyloric stenosis, milk allergies, and chronic upper respiratory tract infections. In fact,, his mother noted that this infant "snored" during sleep, which suggested that he probably continued to have obstructive apnea during the first six months of his life. We learned a lot from this infant and we also found out later that

he was not unique. Highly unstable infants who are being weaned from ventilators or who have major cardiopulmonary or neurological complications, or infants treated with theophylline are not apt to respond to waterbeds with apnea reduction (Korner, 1981).

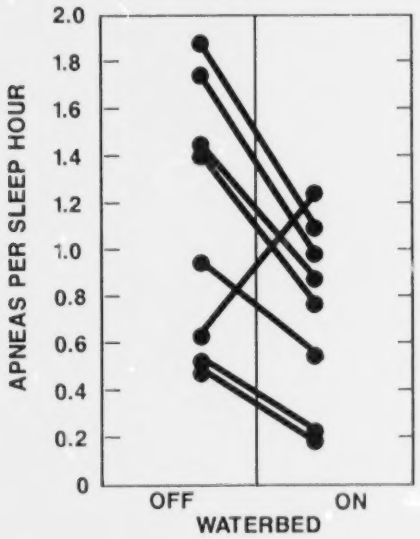

Figure 3. Hourly Apnea with Heart Rates Less Than 80 Beats per Minute, Off and On the Oscillating Waterbed. Matched-pairs *t*-test, Two-tailed, p. < .05.

This brings us to the important issue of individual differences in response to stimulation, be they a function of the infants' health status or their particular individual reaction patterns.

Individual differences in responsiveness to stimulation

In discussing the issue of individual differences in infant responsiveness to stimulation, let me again bring into historical perspective the major swings this field has undergone. Until the 1930's, psychological thinking was characterized by a very strong belief in individual differences, based largely on conviction that intelligence or IQ was innate and fairly impervious to the influences of early stimulation and experience. It was not until the ground-breaking work of Skeels et al. (1938) in the 1930's that the field became sensitized to the developmental importance of early stimulation. As may be recalled, Skeels placed mentally retarded orphans with institutionalized retarded adults who gave these infants a lot of love, stimulation and attention. The development of these infants dramatically changed for the better compared to those who remained in the orphanage, and this difference persisted to adulthood (Skeels, 1966). This and other studies that followed gradually but radically changed prevailing child-rearing views. Individual differences in infant responsiveness were all but forgotten. Clinicians, in particular, espoused the view that the intactness of infant development primarily was a function of what mothers did with, or to their babies and of the amount and quality of early stimulation to which the infants were exposed. This was the era in which mental health professionals tended to blame mothers and mothers blamed themselves for everything that went wrong with their child's development (e.g., Korner, 1961, 1965). The beliefs of this era received a great deal of support from studies using animal models which demonstrated the powerful effect of early stimulation on current and later development. In these studies, as well as in developmental studies with humans, individual differences usually were considered to be a nuisance variable.

During this period, only a very small group of investigators and theoreticians were concerned with the issue of innate or congenital individual differences. Interestingly, most of these workers were influenced by Freud, who, in spite of all of his writings on the effects of early experience, was a strong believer in innate individual characteristics. In his very last paper, for example, Freud (1937) reiterated his conviction more emphatically than in many of his previous papers that "each individual ego is endowed from the beginning with its own peculiar disposition and tendencies." Benjamin (1961), an early infant observer and psychoanalyst, stated the issue even more pointedly; he said that "not only can innate differences in drive organization, in ego functions and in maturational rates determine different responses to objectively identical experiences, but they can also help determine what experiences will be experienced and how they will be perceived." Escalona's (1952; 1963) early infant observations on individual differences in infant responsiveness were also sparked by psychoanalytic thinking as were T. Berry Brazelton's (1962; 1973) studies of early individuality of neonates. In fact, Brazelton's observations with the Neonatal Behavioral Assessment Scale (1973) have not only alerted the world to the newborn's exquisite responsivity to both animate and inanimate stimulation, but they have helped to turn around psychoanalytic thinking, particularly about the innate "stimulus barrier" of newborns (Esman, 1983). Brazelton and his associates showed that rather than warding off all external stimulation in the service of maintaining homeostasis, as was Freud's and other psychoanalysts' impression, newborns *seek* external stimulation. They ward off stimulation only when, for internal reasons, it becomes too intense. Furthermore, there are vast individual differences in both these needs.

The focus of my own research concerning individual differences at birth, begun in 1961, also was strongly influenced by psychoanalytic theory (Korner, 1964; 1971). My interest originated from clinical work with young children and their families that led me to want to investigate the origins of the defense mechanisms. The organism's characteristic way of dealing with, or warding off stimulation and of managing excitation seemed to me the central issue in the development of the defense mechanisms and of preferred coping strategies. I hypothesized that the infant's response to stimulation may be an early behavioral manifestation of individual differences in central nervous system functioning. I thought that such differences may very well help determine how much stimulation individual infants need and how much they can tolerate to function optimally.

In line with this theorizing, I attempted for many years to study individual differences in sensory thresholds and the regulatory mechanisms with which normal, fullterm newborns respond to stimulation. Even though our studies reflected highly significant differences in response to auditory, visual, vestibular-proprioceptive and tactile stimuli, we found that the reliability of the measurements of sensory responsiveness was readily compromised by the minutest fluctuations in the infant's state (Korner, 1972). Since the usual approach to measuring the infant's sensory responsiveness is through the assessment of their motor responses to stimulation, our next approach to studying individual differences in dealing with sensory input and in managing excitation was to assess motor output rather than sensory thresholds. The potential fruitfulness of this approach was underscored by a literature which implicated individual differences in activation and in typical levels of energy expenditure in the development of many different personality characteristics and temperamental differences. In order to study individual differences in activity patterns and characteristic levels of energy output at the very beginning of life, we developed an electronic neonatal activity monitor. In our studies, we not only found highly significant stability of motor behavior (Korner, Hutchinson, Koperski, Kraemer, and Schneider, 1981), but we also found significant relations between the vigor of motions at birth and the later activity and temperament of the same children studied when they were between four and eight years old (Korner, Zeanah, Linden, Kraemer, Berkowitz, and Agras, 1985).

In clinical intervention research, the question is: "Given a stimulation protocol tailored to the individual needs of different infants, how many of them respond favorably?" In experimental efficacy research, the question is quite different: "Does a particular form of stimulation benefit most infants?"

While we have gone on with many other things in the meanwhile, we continue to be interested in the earliest manifestations of responsiveness to stimulation. In a recent study with preterm infants (Korner, Kraemer, Reade, Forrest, Dimiceli, and Thom, 1987), we found significant developmental changes in the infants' proneness to excitation in response to the stimulation inherent in our Neurobehavioral Assessment for Preterm Infants. We also found highly significant individual consistency in response in this tendency over a span of at least three to five weeks.

Aside from Brazelton's work, probably the most influential studies responsible for the sudden "discovery" of the importance of individual differences was the work of investigators who were not particularly influenced by psychoanalytic thinking such as Thomas, Chess et al., (1963) and their followers (e.g., Carey, 1970) and by Bell (1968; 1971). It was not until the very late 1970's and the early 1980's that individual differences in reaction patterns became widely accepted as a most important subject to study in their own right. In fact, we appear to be in the middle of yet another historical swing, in which we tend to devalue earlier approaches to the study of development involving the search for main effects. A good example is that in much recent intervention work, particularly in providing stimulation to preterm infants, it has been stressed that to be of any value, one's approach must be individualized. There are important implications of this new controversy for intervention strategies.

Implications of this new controversy for research

In providing infant stimulation, a very clear distinction must be made between clinical intervention and experimental efficacy research. In clinical intervention, by far the soundest way to proceed is to try to tailor stimulation to what we perceive to be the individual needs and characteristics of each infant. In clinical contexts, one is free to change one's approach if the infant does not respond favorably, and this is exactly how it should be. Even though this approach has many clinical advantages, it also has important drawbacks. With each infant being exposed to an individualized treatment approach, it is often difficult to clearly see which factors in the infant or in the treatment are responsible for some infants failing to respond.

When the effectiveness of clinical intervention is put to the test, the research question is: "Given a stimulation protocol tailored to the individual needs of different infants, how many of them respond favorably?" The question posed in experimental efficacy research is quite different, namely "Does a particular form of stimulation benefit most infants?" Obviously, both research approaches have their own validity and assets. More balance and perspective is needed in our thinking. We should not abandon what some consider to be old approaches for "newly discovered" ones, particularly since frequently these are not all that new. It should not be forgotten that controlled experimental studies that seek to test the main effects produced by uniform research protocols, while clinically less appealing, nevertheless have distinct advantages. By using a randomized design which precludes bias of selection, we can gain a great deal of systematic knowledge about whether or not a given form of stimulation works and about the individual characteristics that are responsible for certain infants failing to respond. Only with a standard treatment protocol as provided in controlled, randomized, experimental studies will the factors inherent in the infants who failed to respond stand out clearly (Korner, 1987).

I should like to conclude on a note regarding the work of clinicians whose primary commitment usually is not to research. Very frequently clinicians intuitively have the best ideas of how stimulation can be used to comfort babies, to encourage learning, improve the parent-infant interaction and to deepen the parent-infant relationship. Clinicians have a different perspective from most researchers and rarely, if ever, will fall into the trap that researchers occasionally find themselves in, namely doing things not worth doing, but doing them well. Researchers would do well to listen to the ideas of clinicians to see whether the study of their questions could be implemented with rigorous research methodology. If they cannot, and this is frequently the

Continued on p. 17 following insert

case, academics should not discourage clinicians from nevertheless trying out the clinical usefulness of some of their ideas. Unfortunately, in some academic settings where only research findings are valued, clinical suggestions are frequently dismissed unless the efficacy of the intervention can be tested in the context of a research study. There may very well not be any measurable long-term or, for that matter, even short-term effects of purely humanistic interventions. However, I would like to say in conclusion, if these interventions improve the *quality of life*, right then and there, they are very much worth doing.

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The Development of Place Identity in the Child

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Developmental psychology and, to a lesser extent, social psychology have taught us that individuals, groups, and still larger aggregates of people change in the patterning of their physical, biological, social, and cultural characteristics over time. This "life-cycle" approach can be applied with equal success to the physical settings that define people's day-to-day lives. Conceptualizing the changing character of physical settings over extended periods of time requires that the environmental psychologist be very sensitive to and fully informed about the processes of human development.

If the child learns who it is through relationships with significant other people, then we must assume that such identity determinations are also rooted in the child's experience with rooms, clothes, playthings, and an entire range of objects and spaces that also support its existence.

Given such sensitivity and knowledge, environmental psychologists can readily begin to consider two very important questions that have been almost completely overlooked by developmental psychologists themselves. First is the question of the ways in which physical-setting properties are significant in the growth and development of the child. In other words, in what ways does the child derive meaning, purpose, form, and structure from the kinds of physical settings that he or she grows up in? And inextricably tied to this question is the no less important one of how physical settings are themselves shaped and influenced in unintended ways by the continuing growth and development of the child.

The concern in this article is with *place identity*, or what can be referred to as the physical-world socialization of the child. Simply stated, place identity is conceived of as a substructure of the person's self-identity that is comprised of cognitions about the physical environment that also serve to define who the person is.

The process of socialization and self-identity formation is incremental and has been broken down into stages by a number of developmental theorists (Piaget, 1954; Erikson, 1968). Individuation begins with the infant and evolves largely through sensory and perceptual experiences—vision, audition, tactile sense, and so on. The child not only learns the appropriate labels for objects and for people but also learns through social interaction and object use what its given relationship is to each such object and person. These relationships between the child and other people and objects indirectly serve to define who the child is to itself and therefore to others as well. It is our contention, however, that a critical consideration is missing from the developmental literature of self-identity formation. There has been an almost complete neglect of the role of the physical environment in such identity formation. If a child acquires the knowledge

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and understanding of who it is by virtue of its dependent and continuing relationships to significant other people, then we must assume that such identity determinations are also rooted in the child's experience with rooms, clothes, playthings, and an entire range of objects and spaces that also support its existence. Certainly this inanimate world is ever present and inherent in the child's interactions and relationships with significant other people. In effect, children learn to view themselves as distinct from the physical environment as well as from other people and do so by learning their relationships to various objects, spaces, and places including ownership, exclusion, limited access, and so on. Certain spaces and places, because they are "owned," familiar, and useful and can be controlled, satisfy and maintain the integrity of the child's sense of self, including the *definition* of that self.

But, there is no physical environment that is not also a social environment, and vice versa (Ittelson, Proshansky, Rivlin, & Winkel, 1974). This means that whether the concern is human development generally or, more specifically, self-identity formation, spaces and places must necessarily be fundamental considerations in this search for understanding the development of human behavior and experience. In dealing with the physical world of adults or children, an important question to ask is, What are the effects of the built environment on personal development? It seems

particularly important in this era of accelerated urbanization and rapid technological development in which the computer in concert with sophisticated electronic systems has had major effects on the mass media, telecommunications and social interaction, human mobility, and life in the family setting. Some may assess this new "high-tech" world as alienating to human growth and development, whereas others will see great potential and opportunity; in either case, it is clear that our physical and social environments are characterized by *change*. Similarly, our theories of human development must be dynamic and able to capture the flexibility as well as stability that characterizes self-identity.

The world is not simply an array of separate and isolated sociophysical settings. Children play, eat, rest, socialize and learn in a number of places, and they have particular needs, expectations, and fears related to these places.

Place identity, as a substructure of self-identity, should not be thought of as a stable and integrated cognitive structure. Certainly it has enduring aspect, that is, accumulated cognitions, but many of its other components are given to change over time. These cognitions can be conceived of as being organized into one of two types of "clusters." One type consists of the memories, thoughts, values, and preferences that relate to a particular setting which the person experienced or, more generally, to the type of setting it represents (e.g., school, household). The second type of cluster has to do with the relationship among settings, that is, the home, school, neighborhood, and so on. The world is not simply an array of separate and isolated sociophysical settings. Children play, eat, rest, socialize, and learn in a number of places in relation to which they have particular needs, expectations, and fears. Thus, the place-identity cognitions that connect one setting to another emerge or develop because of the successive and repeated pattern of their use and because of the overlapping activities and social roles across settings.

An individual's place-identity cognitions are related to the past, the present, and the future. It is the person's "environmental past"—that is, the early physical space and place cognitions of childhood—that has the most profound influence on the person's subsequent place identity. Some of the person's place-identity cognitions are positive and others are negative, but both kinds of cognitions serve to define who the person is. In other words, places, spaces, and objects that in effect tell the child, "This is not good for you" are as important in contributing to his or her self-identity as those that are useful and satisfying and therefore are the necessary reinforcers of this identity.

In addition to actual experiences with the physical environment, place identity is very much influenced by the *social* meanings that are attached to spaces and places by other people, those adults who are influential in the child's life. The perspective and orientation of the parents as to the nature of the home and neighborhood, how those spaces are to be used, to what extent they are to be manipulated, and what dangers and taboos are to be recognized in them play a central role in the development of early place-identity cognitions. As children venture away from the residential area, to school, and meet children from other kinds of neighborhoods and homes, they become aware of "outsiders' " evaluations of their neighborhood and home settings. The beliefs and attitudes of acquaintances as well as those expressed by the agents of socialization all contribute to children's definitions of who they are.

In terms of a child's physical world socialization, the home is undoubtedly an environment of primary importance. However, as the child grows and extends its range beyond the home, other settings such as the school and outdoor play areas in the neighborhood take on their own considerable importance in the socialization process. These three overlapping physical and social realms are probably the most influential setting in the life of the child and are the three we will discuss in greater detail later in this article. Although we will talk about each setting individually, we want to make clear that it is the *pattern* and the interrelationships between and among the important setting of a child's life in which we are interested, The child develops particular preferences, skills, and behaviors within each setting; however, it is the interface between the settings that constitutes daily life and best captures what we mean by *place identity*.

It must be understood that place-identity cognitions do not evolve and change merely in response to properties of the physical environment. They are also a product of the social roles played by the person and the nature of his or her own physical makeup. The physical and social adjustments that accompany the adoption of an occupational role or parenthood, for example, have implications for the self-identity and therefore also for the place identity of the individual. Each new such role of status carries with it a correspondingly new or altered physical setting. Such changes may not necessarily mean a significant or even a gross change in the physical setting but rather may represent only a change in the way one perceives the environment. A clear example is elderly people whose slow but inexorable decline in physical capacities very much limit their ability to travel around the city which for so many years before presented no difficulty at all. Certainly this new relationship for the elderly to their urban environment has implications for concurrent changes in self-identity. Further, at any time in the life cycle there are social forces that go beyond individual development and cause changes in self-identity and therefore in place identity as well (e.g., sudden and rapid technological changes, short-term changes in the attitudes and values of a society, and demographic and sociological changes in a community or city).

The development of place identity

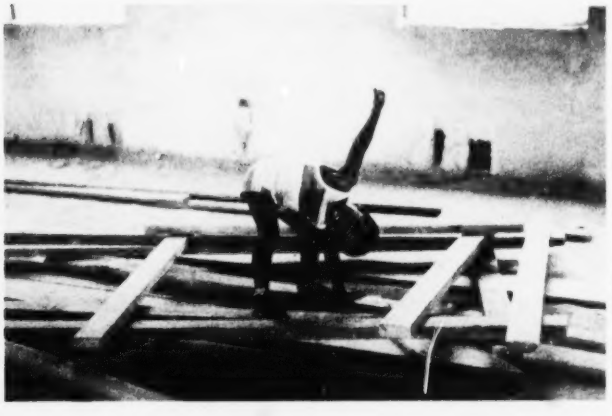
It is our purpose in this paper to understand the relationship between the child's increasing knowledge and mastery of its physical environment and the emergence of its place identity. A toddler learning to walk is confronted by a variety of surfaces and changing

ground levels on which to practice and perfect its skills. There are stairs of different widths, moving stairways, pebbled paths, grass, and asphalt driveways for which slight adjustments must be made. The child's broadening experience with physical-setting features that directly relate to walking leads to mastery and confidence which in turn tell the child something about the success of its own development. Contributing to that self-knowledge are the praises (or admonitions) the child receives from parents, grandparents, brothers, and sisters who are pleased (or displeased) to see that the child is (or is not) acquiring the physical-world skills that are expected.

This physical-world socialization occurs primarily in the home (or child-care setting), the neighborhood, and the school. It is in these contexts that many of the important social roles and environmental skills and relationships are learned. All of these are aspects of place identity that persist and form the "lenses" through which the child will later recognize, evaluate, create, and manipulate physical spaces and places.

Place identity and the home setting

From the earliest moments of life, the infant's discovery of the world and growing self-awareness begin within the context of this setting. What is so often stressed in discussions of the development of the self is the child's learning to distinguish the self from the "not-self." But inevitably the not-self implies distinguishing oneself from others, particularly those directly involved with socialization. To do this, however, children must also distinguish what is social in their environment and what is physical. It may be that to distinguish themselves from others children must first learn to distinguish themselves and those others from physical objects, spaces, and places.



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Out of an undifferentiated mass of sound, light, texture, and movement come the recognition and identification of meaningful spaces and places and the steady comprehension of how to use them. As this process continues, children develop qualitative associations to objects, places, and spaces—some positive, some negative, some neutral, and some a combination of such reactions. As the child becomes mobile, its pattern of movement through the home will reveal intentions and motives that clearly imply the emerging development of a place identity. The child not only knows what objects are its own, but determines at some level where they should be kept, how they are to be used, and when they can be used by others. This identity is revealed by a whole set of physical-setting expectations which are expressed directly when they are not met.

The infant acquires visual and motor skills involving objects, places and spaces in the home that "belong" to him or her. Both child and caregiver recognize these accomplishments as indications of emerging individuality.

The child learns in time that it is related not only to other people in the home but also to the physical objects and places within the home. The increasing independence of the child can be accomplished and demonstrated only through the manipulation of these physical objects and places. Both the child and those responsible for the child will use such accomplishments as indications of emerging *individuality*. The slow metamorphosis of a totally dependent infant into a separate and distinct individual is aided and continually reaffirmed by the acquisition of visual and motor skills (e.g., following the animals on a mobile hanging overhead, learning to eat with a spoon, learning to dress by opening drawers and closet doors to get out the clothes), particularly when they involve objects, places, and spaces that "belong" to him or her. As we have stated elsewhere (Proshansky, Fabian, & Kaminoff, 1983), a child learns the distinction between "me" and "my mommy," but the distinction between "me" and "my room" equally serves to define who that child is. It can be said that a child's room, replete with all its belongings and its ability to provide sanctuary from the control of parents, is a place of disproportionate significance in the child's development of place identity and therefore self-identity.

In addition to creating a personal world within the home, children also learn that spaces and places are shared. They learn that physical settings are not static but are continually changing because the presence of other people changes them. Thus, there is a tension between the normative and the personal uses of objects, spaces, and places. Autonomy and self-identity are defined by the knowledge that one has some control over one's physical environment, but it is equally true that self-identity involves dependence on and cooperation with other individuals. From the start, children are continually subject to a socialization process that defines their behavior with respect to other people, the activities they will engage in, the goals and tasks to be accomplished, and so on. Social class and ethnic and sex differences set the stage on which these expectations are played out, but from these basic social roles many other differences begin to emerge that affect the child's resources and capacity to cope.

What we wish to stress here is the very close relationship between the social roles the child must learn and the normative aspects of space and place utilization. The status of being a child carries with it many spatial restrictions which are slowly withdrawn

as the child demonstrates competence and responsibility in the physical world. Very young children discover over time who controls the various spaces within the home and learn to respect the spatial autonomy and privileges of older household members. For example, they may first learn that access to the bathroom is not possible when it is occupied or that they may not go into Mommy's and Daddy's bedroom when the door is closed. But with increasing age accompanied by role changes and greater environmental skills, children achieve their own control and autonomy over particular spaces and places.

The status of being a child carries with it many spatial restrictions which are slowly withdrawn as the child demonstrates competence and responsibility in the physical world. Very young children discover over time who controls the various spaces within the home.

The issue of spatial autonomy is an important one and in a very real way marks the development of independence. Laufer, Proshansky, and Wolfe (1973), Laufer and Wolfe (1977), and Wolfe (1978) all observe that privacy as achieved through some degree of control over the physical environment is absolutely essential to healthy psychological development. In some ways, however, spatial autonomy for children is viewed more as a privilege than as a right in our culture and is granted only when children show evidence of internalizing the social roles and environmental skills that are expected of them.

Wolfe (1978) points out that the child has few if any opportunities for limiting other people's control or access to those things and spaces. However, the child's need for some degree of control is still present. This is clearly manifested in what the child says and does not say, that is, through the withholding of information, usually in the form of making up stories or telling lies. Wolfe describes this "information management" as the child's first opportunity to achieve personal privacy by creating and controlling boundaries between himself or herself and others. Over time children learn the spatial needs of other people in the household and as a result gain opportunities for achieving their own degree of spatial privacy. These person-environment relationships are very much a part of the place-identity development and thereby influence the child's future needs for and methods of achieving, for example, privacy, territoriality, or personal space.

The development of place identity requires not only that children learn to recognize objects, places, and spaces and to share them with other people but also that they know how to use them. Physical-world socialization requires learning the particular behaviors and responses that are part of space utilization. When thinking of the home setting one thinks of rooms, hallways, furniture, and all kinds of utilitarian and decorative features, but in addition there are switches, electronic devices, radiators, refrigerators, lights, sharp edges, high places, low places, and door knobs. Although the home is a relatively small physical setting, it is filled with complexities that must be mastered. The environmental skills at first are quite limited and specific (e.g., walking a few steps, getting over a threshold). In time, as they become integrated and more goal-oriented, the child's intentions become clear, such as going from the living room to the bedroom or getting a toy down from a shelf. These skills in turn become more complex so that children know how to react and behave in a variety of situations. In time, they come to understand that the household is part of a larger context, whether it be a neighborhood of single- or multiple-family homes where strangers share sidewalks and public spaces or an apartment building where strangers share hallways and elevators.

In summary, the home is a critical sociophysical setting in the life of the child because it is the arena in which most early learning occurs. Self-knowledge, knowledge of others, and knowledge of the environment all begin there. Many of these early self-perceptions and place-identity cognitions will persist and determine the kind of experiences the child is likely to have in later settings.

Place identity and the neighborhood

With biological and social growth comes the challenge to the child of learning to be competent not just in the home but outside it as well. This, of course, is an incremental process beginning with the parents' or other caretakers' having complete supervision and ending with the child's independent use of the neighborhood and finally of other neighborhoods as well.

Privacy, as achieved through some degree of control over the physical environment, is absolutely essential to healthy psychological development.

As adults, we tend to lose sight of the drama involved in the move from the home to the neighborhood, notwithstanding this "outside world" presents a far greater complexity. There are streets to be crossed, routes to be learned, stores to be recognized, and sounds, smells, lights, and shadows to be experienced. Furthermore, neighborhoods are full of people, including all the individuals whose recurring presence marks them as familiar and enduring features, the local butcher, the neighbors next door, the postman, and many others. In addition, there are relative strangers whom the child in time not only recognizes (as someone who lives down the street) but sees as another stable feature of the neighborhood. Children must learn their social role relationships to all these individuals, and in every instance the relationships involve how they are to act in this neighborhood setting. Thus, one does not walk too close to strangers; the neighbor's lawn is not a public space; one says good morning to the person but not to an unidentified person who is visiting a neighbor down the block.

Once children are exposed to the neighborhood setting, their cognitive task is a difficult one. They must assimilate the tremendous complexity of the neighborhood setting and at the same time learn to recognize differences, make choices, pay attention to some things and not others, and clarify ambiguities (Rapoport, 1977).

The cognitive function that is clearly a prerequisite to the acquisition of environmental understanding, environmental control, and environmental competence in the neighborhood setting is large-scale environmental perception and cognitive mapping. A cognitive map, for this discussion, is an internal schematic representation of a given locale showing particular places and the connections among them.

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Clearly, the child's perceptions and conceptualizations of the physical environment build up slowly, becoming progressively more complete and sophisticated. It seems reasonable to assume that the young child first develops a cognitive map of the home. Moreover, in the home at least, the map is not simply a schematic of where each room is, the furniture in them and the paths taken to get to them. It also includes all the social information collected by the child about that setting, including norms about what takes place in given spaces, behavior in response to others in these spaces, and how these spaces are controlled and by whom. Cognitive maps of large-scale settings involve landmarks, paths, and routes, but probably to a much lesser extent the kind of social information collected about the home.

It is our belief that cognitive representations of space serve not only for orientation purposes, but also help to establish the child's sense of self we have called place identity that is influenced by the specific places and spaces in the life of that child and in the connections between them. Large-scale environmental perception is an active process whereby the child responds to certain features of the immediate world which are internalized in the form of cognitions that express not only their contents but also the child's feelings, attitudes, and behavior toward them. It is no exaggeration to say that place identity is in part a cognitive map of physical settings, past, present, and future.

Because of the greater number and variety of physical spaces in the outside neighborhood setting which involves large numbers of people, many of whom may be strangers, children must develop nonverbal strategic interaction skills. By this we mean the body messages and gestures that people use to convey their spatial intentions, including the head and eyes, particularly in dense urban areas. For example, children walking to school, because of warnings they have received from parents, may persistently keep their eyes focused so that they do not look at any strange adults as they pass. They may have been taught not to stare at strangers and instructed not to talk to them, and thus the focused look away communicates this intention.

Both cognitive mapping and nonverbal strategic interaction skills enable children to act competently and confidently in the neighborhood setting. In some ways this setting is even more critical than the home in its implications for place-identity development. It is by definition a public setting filled with other children and other adults who are there not only as objects and actors but also as observers and judges of the behavior of others. It is here that the child learns its public persona, which necessarily includes those environmental skills critical for relating to and using a physical setting. These

In the dramatic move from home to neighborhood, there are streets to be crossed, routes to be learned, stores to be recognized, and sounds, smells, lights and shadows to be experienced. And neighborhoods are full of people. Children need both cognitive mapping and nonverbal interaction skills to act competently and confidently in the neighborhood setting.

environmental skills are relevant not only to the child's competence in and control of the physical environment, but they also have consequences for the child's social development. It provides the setting in which children can be away from the watchful eye of adults and as a consequence can explore the social role of "friend" rather than of "sister" or "daughter." By going outside alone, playing in a nearby schoolyard, or going beyond the neighborhood, the child learns to use a new and different setting outside the home with new and different people. In effect, the child's testing of its autonomy is slowly transferred into a conception of self as independent and relatively free.

The neighborhood is a setting that facilitates what Moore and Young (1978) have referred to as "volitional learning" (p.88). There are opportunities for the child to manipulate elements of the outdoor neighborhood setting in ways that are not possible or permissible in the home, such as construction with found objects, playing in dirt and puddles, or using outside settings for other purposes (e.g., the stoop of the house becomes an entrance to the fortress). There has been research emphasizing that such environmental play contributes

in an important way to social and cognitive development (Hart, 1978; Saegert & Hart, 1978). We would emphasize just as strongly that these experiences and the particular places and spaces they involve also become an essential part of place-identity cognitions.

The urban child's experience of the neighborhood may be extremely limited in these respects because of its threatening features—the dangers of street traffic, criminal elements, and even existing tensions between contiguous neighborhoods. These threats go far beyond what is encountered in the neighborhood of suburban children. On the other hand, it is relatively patent that the city child's exposure to local merchants, different racial and ethnic types, diverse street life, and a wider variety of spaces and places to explore provides greater diversity and environmental richness. The implication here is that the skills of household living that the child has acquired must be deepened and extended to deal with public spaces, and these skills must involve not only the richness and diversity of a complex physical setting but also those aspects of it that threaten and/or are an actual danger.

Perhaps the most difficult aspect of a child's move from home to large-scale settings, in spatial terms, is the required redefinition of essential person-environment relationships such as privacy, territoriality, and personal space. The strategies the child develops for achieving privacy in the home are not easily transferable nor even relevant to the neighborhood. Merely the addition to the child's experience of large numbers of people who are essentially strangers makes new demands on the ability to achieve privacy or establish personal space when it is needed.

The strategies the child must develop in order to be alone or to withdraw in a public setting have to be more sophisticated, creative, and complex than those required at home. The display of nonverbal messages, the reliance on fantasy, and the sensory ability to screen out unwanted stimulation all serve an adaptive function. Behavioral and cognitive coping mechanisms continue to develop as the child is exposed to an increasing number of public settings (e.g., theaters, parks, libraries, museums). Such strategies have become the hallmark of the urbanite who develops a complete repertoire of adjustments to meet the requirements of constantly changing daily experience.

Place identity and the school setting

Once the child is of school age its waking life changes considerably, since much of the day is spent in the school setting. With the increasing number of single-parent households and working mothers and a growing emphasis on early socialization experience, the age at which children begin school is being lowered considerably. By the age of two years many children are spending time in school-like settings (day-care centers, preschools).

By definition the school is a designed and premeditated agent of socialization. In comparison with the home and neighborhood settings, the school is in general the most predictable and most rigidly structured sociophysical setting in the child's early experience. Whatever physical space conceptions, needs, and expectations the child has developed in the home and neighborhood settings, these must be fitted into the requirements, activities, and normative demands of the classroom as a social learning environment.

Environmental psychologists describe an institutional setting as one that is characterized by a high degree of organizational control, routinization of behavior, and limited opportunities for personal choice. It is the school's emphasis on control of the behavior and experience of the child that establishes the institutional nature of its physical setting.

There has been remarkably little change in both popular and professional conceptions of what constitutes a proper classroom learning environment. The traditional approach has been rows of desks and chairs facing the teacher's desk in the front and center of the room. The only recent exception to this was the open education philosophy of the 1960s and early 1970s which specifically promoted the idea of individualized learning in a flexible, multipurpose space. In a review of the open classroom concept, Proshansky and Proshansky (1978) came to the conclusion that individual learning, rooted in an individualized special setup, is not enough. What is needed is not only a change in the physical setting, but corresponding changes in curriculum, teaching strategies, and methods of evaluation, and these in turn require a shift in educational philosophy and goals.

One can make a conceptual distinction between the school and the other settings we have discussed in this paper by thinking of the school as an *institutional* setting. This has allowed environmental psychologists to describe a sociophysical setting characterized by a high degree of organizational control, routinization of behavior, and limited opportunities for personal choice (Rivlin, Bogert, & Cirillo, 1981). Seen from this perspective, the school setting allows us to know any one child's or every child's spatial experience and in this respect helps to reveal some important implications about place-identity development.

Most often the child's experience of the school building is dominated by his or her own classroom. Travel through any other part of the building is generally monitored and controlled, at least insofar as primary education is concerned. Thus, describing the complexity of the whole school building may be a moot point in regard to the spatial experience of any particular child.

It is the school's emphasis on control of the behavior and experience of the child that establishes the institutional nature of its physical setting. Unrelated to educational goals is the reality of 20 to 30 children in one classroom, a "box" with rows of seats in which the teacher is not only the educator but the agent of control. The most widely adopted strategy for teaching such a large group is to match the uniformity of the physical setting with uniformity in behavior so that the children can be dealt with as a manageable unit rather than as a collection of 20 very different individuals. Using the example of kindergarten children, all nap at the same time, have snacks at the same time,

and participate in learning activities at the same time. While this ensures that all children will be treated equitably in their socialization experiences, one has to wonder what the consequences are of denying the children personal space and privacy and the inherent freedom of choice involved in both.

The school setting plays an important role in the place-identity development of the child. Repeated and successive exposure to the school setting during the formative years necessarily suggests that many of the impressions, attitudes, skills, and ideas regarding the physical conditions necessary for intellectual learning are developed in this context. But we cannot ignore the fact that each of the children differ from each other. This means that each must also learn an increased repertoire of behavioral strategies for achieving the kind of person-physical-environment relationships that it needs and wants. It may well be that some children learn better in private or standing up than in a group in which each child occupies a seat, but the teacher's control and supervisory function, not to mention the need for an appropriate classroom setting, make the "individual differences" approach to teaching difficult, if not virtually impossible. Nevertheless schools are social as well as educational settings, and despite their institutional nature children develop techniques for social interaction, social withdrawal, and even freedom of movement in the face of structures against all of these. In addition to the prevailing spatial norms defined by the teacher and in turn by other children, there exists another more informal set of rules developed by children to circumvent the controls and restrictions. If we accept that children have different requirements for privacy and that opportunities therefore are critical to healthful psychological development, then undoubtedly one must look for latent as well as manifest norms in the use of physical space in the school setting.

The complexity and richness of the school setting is in a sense much diminished by the rule structure imposed upon the students. Certainly the spatial freedom that children have in the school setting varies according to the school and its educational philosophy, but in few if any cases does the school provide the opportunities for exploration, manipulation, and innovation in the physical environment that are readily available in the neighborhood or home. It is specifically in this regard that one can appreciate the virtues of open-classroom education when there is a relevant educational philosophy to support and complement it.

On the other hand, it is important not to overstate the case of the institutional nature of the school as a physical as well as social setting. The child does have space that "belongs" to him or her, free movement about the classroom does occur at specific times, and children are given the opportunity to decorate and personalize classroom spaces and places. Nor can we ignore the fact that learning to learn, work, and play in groups is an important aspect of the child's social education. What is needed is more attention to learning and experiencing in unique ways; to this end there has been growing emphasis, at least in New York City, on alternative schools wherein classes are smaller, are theme-oriented, and above all are ready to consider individual need within the already established group setting (E. Proshansky, 1981).

Urban image and identity

We have described above the influence of the home, neighborhood and school settings in the development of place identity, and even all three of these significant settings taken together represent only a part, albeit an important part, of the child's physical-world socialization. As the child gets older, more and more settings become part of its experience, resulting in more fully elaborated cognitions related to the physical environment. At each stage of growth, a step forward in the child's social development is accompanied by some new experience in the physical world.

At each stage of growth, a step forward in the child's social development is accompanied by some new experience in the physical world. The child's place identity reflects the integration of these physical-world settings, including all their variety, diversity, and complexity, as well as their interrelatedness.

The child's place identity reflects the *integration* of these physical-world settings including all their variety, diversity, and complexity as well as their interrelatedness. The child repeatedly leaves one setting to behave in another; and this movement from one setting to the next, in which there are differences both in the structure and content of the spaces and places, means that the child learns not only to differentiate these distinctive environmental properties and requirements but also to recognize their similarities. The child also learns how to adapt and modify its own behavior as movement from one setting to another occurs. Place identity conceived in this sense is not a simple cognitive structure, for in fact the day-to-day physical existence of the child is characterized by a growing number of settings, the presence of other people, and special skills needed to use these settings.

If, as we have contended, the place identity of a person is a complex and integrated defining "image" of the physical world as he or she has experienced it, we must recognize that this image is becoming increasingly urban. All societies in this century, both eastern and western, are moving or have moved toward an *urban existence*. Within and between different nations, regions, or societies of the modern world, the degree of urban existence varies, and so too the extent to which place identity represents urban identity. For those whose existence begins and ends in large metropolitan centers, the emergent urban identity will differ to some degree from that of those whose life is confined to a small town. On the other hand, because of increasing connections between big and small communities there will also be important common elements. Television sets, radios, automobiles, and now the computer have transformed and continue to transform small-town and suburban life to render it progressively more urban.

Increasing urbanism changes the frequency, variety, and intensity of human relationships. It also, of course, changes the form of the physical environment. For

example, what our children will come to know as a bank—most likely a nonhuman, computerized, video display terminal setting—will be quite different from the image held by an earlier generation. And the changes are occurring with unprecedented speed. Because of this, the home, the neighborhood, and the school all constitute places of greater complexity for the individual. There are a great many new learning demands made on the child today, requiring language as well as motor skills. And superceding all of the specific skills required is an intellectual flexibility necessary to cope with the rapid technological and accompanying social changes we are now experiencing.

An important question to be answered is how to describe urban identity. At this stage in the conceptualization of place identity this is clearly an empirical question. For the moment, we must understand that urban identity, as we have formulated it here, is a type of place identity that characterizes all individuals brought up in and socialized over an extended period of time in an urban setting. Ways of seeing, using, and drawing satisfaction from the physical world of the city have been assimilated and integrated in the place identity of the person to the point that his or her thinking, experiencing, and behaving in the world are at times predetermined. Urbanites can no more escape the influence of their place identity than that of their social identity.

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